THE INSTITUTE OF PHYSICS

47 BELGRAVE SQUARE, LONDON, S.W.1.

BULLETIN

No. 40 APRIL, 1953

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Information in this Bulletin is not intended for general publication: your copy should not therefore be passed to a library.

THIRTY-THIRD ANNUAL GENERAL MEETING

NOTICE IS HEREBY GIVEN that the Thirty-Third Annual General Meeting of The Institute of Physics will be held at 8 p.m. on Friday, May 29, 1953, in the Town Hall, Bournemouth. Attendance is limited to Fellows and Associates of the Institute. The business to be conducted is the consideration of the Board's report, the accounts and balance sheets for 1952, the declaration of the election of the Honorary Officers and other members of the Board nominated, and the election of auditors. A copy of the annual report and accounts is printed in this issue of the *Bulletin*. Further copies will be sent on request.

B. P. Dudding,
Honorary Secretary.

April 10, 1953.

THE INSTITUTE'S FINANCE

The Board believes that members will wish to study the Institute's 1952 accounts as a whole ; a consolidated income and expenditure account is therefore printed on the next page. This combines the Institute's official (Companies Act) account (printed on p. 48 of this *Bulletin*) and the Institute's Endowment Trust Fund Account (printed on p. 50) which are published as part of the Board's official Annual Report. For the purpose of those accounts the labour and overhead charges are divided between the Institute's own account, the educational, scientific and other work carried by the Trust Fund and publications, in a manner agreed by the Auditors, which represents equitably the increased effort which the Institute now devotes to publications.

The Finance Committee under the chairmanship of the Treasurer has kept a close watch on expenditure, and it will be noted that the year's consolidated accounts show a final surplus of £3322 compared with a budgeted estimate of £1200 (see *Bulletin* of February 1952). This surplus is almost exactly equal to the increase during the year in the value of the stocks of publications (mostly books). Although there is every reason to suppose that these stocks are a good investment the Finance Committee considered that the capital represented by them is now nearly as great a proportion of the Institute's resources as is permissible and must not be increased after 1953. To this end the money received from sales of the newly published books will be applied to the reduction of the " book value " of this stock until the cost of printing and producing the publications it represents has been recovered. There is thus a " stock depreciation reserve " item of £653 this year.

The generous support of the catalogue by firms and other organizations which exhibited at Glasgow resulted in a surplus of just under £1000 being added to the Endowment Trust Fund.

The charge for the cost of Journals supplied to members without charge additional to their membership fees has been shown in this account to call attention to its continued increase ; as this payment of £1814 is made from the Institute's General account to the Endowment Trust Fund account, it appears on both sides of the Consolidated account.

Members will note from the balance sheets printed on p. 49 and p. 50 of this *Bulletin* that the Institute's capital is still at a level which must give the Board continual anxiety in these uncertain days, especially as only about £10,000 are liquid assets—sufficient for about 3 months at the present rate of expenditure. It will be remembered that it was largely for this reason that members agreed to an increase in their subscriptions in 1950. Until, therefore, the Institute has been able to replace most of the investments sold to provide for the alteration and adaptation of the House, the amount of capital available, and particularly that part which could easily be converted into cash will have to be closely watched. Despite the satisfactory surplus on the year's working new commitments cannot therefore be undertaken at present.

Consolidated Income and Expenditure Account for the year ended 31st December, 1952

1951 £		1952 £	*1951* £		1952 £
	To Office and General Expenses :—		*15,396*	By Receipts from Publications ...	20,595
9,029	Salaries and National Insurance and Staff Superannuation ...	10,920	*4,795*	„ Receipts from Advertisements in Journals	5,516
2,528	Rent, Rates, Lighting, Cleaning and Maintenance	2,665	*10,428*	„ Members' subscriptions, entrance and application fees	10,921
1,128	Postage and Telephone... ...	940	*215*	„ Dividends and Interest	201
552	Travelling Expenses, Board and Committee meetings	636	*366*	„ Donations received by Trust Fund...	164
	„ Production and Distribution of Publications (excluding cost of labour		—	„ Glasgow Conference Income ...	3,563
13,780	and overheads)	16,894	*500*	„ Royal Society Publications Subvention	500
1,276	„ Office and miscellaneous Printing and Stationery	1,716			
126	„ Bulletin (net)	126			
1,385	„ Branches and Groups (including Australia)	1,608			
50	„ Conferences and Conventions ...	2,689			
93	„ Educational work, Examinations (net) and Special reports ...	209			
594	„ Miscellaneous expenses and House vote	624			
30,541		39,027	*31,700*		41,460
1,679	„ Copies of Journals supplied to Members	1,814	*1,679*	„ Copies of Journals supplied to Members	1,814
2,607	„ Surplus for the year	5,795	*1,448*	„ Increase in Stock of Publications ...	3,362
£34,827		£46,636	*£34,827*		£46,636
	To Amount written off expenditure on		*2,607*	By Surplus brought down	5,795
469	alterations, etc., to house... ...	515			
311	„ Depreciation of Furniture and Fittings	320			
985	„ Leasehold Redemption Policy ...	985			
—	„ Books, Stock depreciation reserve ...	653			
842	„ Net Surplus for the year	3,322			
£2,607		£5,795	*£2,607*		£5,795

PRESIDENTIAL CHAIR

South Wales Branch Gift

In December 1951 the Committee of the South Wales Branch of the Institute suggested to members of the Branch that they " should make a gesture of goodwill to the Institute as a whole by presenting a single piece of furniture such as a President's Chair for the Board room which would also be used by the Chairmen of the many committees which use the room." A limit of five shillings was put on the individual donations and the proposal was widely supported. Sufficient was contributed to provide the beautifully designed, carved chair which has now been placed in the Board room and which is shown in the photographs. The chair is of light oak, upholstered in red hide. It was used for the first time at the March meeting of the Board, after being presented to the President by Dr. T. V. Starkey, Chairman of the South Wales Branch, who said that he hoped other Branches would follow this example.

CONFERENCE ON LUMINESCENCE

The Electronics Group of the Institute is organising a conference on luminescence with particular reference to solid inorganic phosphors. The Conference is to be held in Cambridge from April 7 to April 10, 1954. Principal papers have been invited from leading workers in the field and contributions will be welcomed for inclusion in or discussion during the Conference sessions. The outline program is as follows :—

Wednesday, April 7 (*evening*)

Formal opening and inaugural lecture.

Thursday, April 8

Phosphor applications and future prospects.

Principal papers on cathode ray tube screens and fluorescent lighting.

Papers are invited on these and other applications.

Friday, April 9

Physical Chemistry and atomic structure of phosphors.

Principal papers on sulphide phosphors and manganese as activator in phosphor systems.

Papers are invited on these topics and those dealing with the nature of luminescence centres.

Saturday, April 10

Physical mechanisms of luminescence.

Principal papers on absorption, emission, transport and storage processes in phosphors, and on luminescence and the electrical properties of phosphors.

Papers are invited on these and other relevant topics.

Ample time will be provided for formal and informal discussions. During the proceedings there will be an evening demonstration on problem phenomena in luminescence.

Further details will be announced shortly.

All enquiries and contributions should be sent to Dr. S. T. Henderson, F.Inst.P., *c/o* The Institute of Physics, 47 Belgrave Square, London, S.W.1, and marked " Luminescence Conference."

PHYSICS IN TECHNICAL COLLEGES

II—THE ROYAL TECHNICAL COLLEGE, GLASGOW

By Professor J. S. RANKIN, B.Sc., Ph.D., M.I.Mech.E., F.Inst.P.

The Royal Technical College, Glasgow, has the status of a University College. It was affiliated to the University of Glasgow in 1913 and has been on the University Grants Committee's list since 1919. It had its origin in Anderson's University founded in 1796 under the remarkable will of a remarkable man, John Anderson, Professor of Natural Philosophy in Glasgow University, who bequeathed the whole of his property, " except what is contained in the painted chest, with three locks," to the public " for the good of mankind and the improvement of science."*

Accordingly, the principal work of the Natural Philosophy (Physics) Department of the College is the teaching of physics and applied mathematics required by (*a*) students going forward to the Honours B.Sc. Degree of Glasgow University in Applied Chemistry, various branches of Engineering, Metallurgy and Pharmacy, (*b*) students taking the Associateship of the College in these subjects and in other technologies. There are at present some 250 full-time students attending the physics classes for the degree and a further 140 for the associateship.

Evening classes are also provided covering the physics and applied mathematics required by students studying for the science degrees of London University and for the endorsable physics subjects for students holding the Higher National Certificate in Applied Physics, namely, X-ray radiography and crystallography, electron microscopy and vacuum physics. It is the policy of the College for the classes leading to the Higher National Certificate in Applied Physics to be taught at other schools and colleges in the Glasgow neighbourhood.

The laboratories are well equipped for industrial test work and for research (including investigations leading to the Ph.D degree) and although the efforts of the department during the past few years have had to be concentrated on the development of the applied physics course, research activities, as in pre-war years, have continued.

The accommodation consists of a lecture theatre seating 240 students and a lecture room with 80 places : several of the laboratories are designed to be used on occasion for small lecture and tutorial classes. There are eleven laboratories, together with a testing laboratory, an apparatus room, a mechanics' work-shop equipped with modern machine tools, a departmental library, the whole, including the Professor's room, extending to an area of some 10,500 square feet.

The principal development which has taken place since the last war has been the institution of a qualification in applied physics of university honours degree standard, designated the Associateship in Applied Physics. This has, of course, entailed the provision of new lecture classes, laboratories and equipment. A short description of the courses and facilities provided for this qualification follows, but in order to make clear the aim and the planning of the course and its place in the scheme of education in science to-day, it is desirable, if not necessary, to refer to the history of the teaching of applied science in Glasgow and the West of Scotland.

The landmarks are : (*a*) the pioneer work of John Anderson already mentioned, (*b*) the foundation in 1840 at Glasgow University of the first chair of engineering at any British university, albeit the first professor was so " cold shouldered " that much trouble was raised in providing him with a room, a black-board and a place on the time-table, (*c*) the affiliation of the Royal Technical College with the University of Glasgow, in 1913 as already stated. This affiliation resulted in B.Sc. degrees in applied science of Glasgow University becoming open to day students who had taken their whole course in the College, (*d*) the institution of the B.Sc. degree of Glasgow University in applied chemistry (in 1915), also open to College day students.

Thus, the history of the College, its location amidst the West of Scotland engineering, shipbuilding and (now) light industries, together with its large number of students—to-day about 6,000 day and evening students—conspired (not forgetting the tradition of Kelvin, surely the prince of applied physicists) to suggest that a higher qualification in applied physics was, in the natural and logical development of the present scientific age, long overdue.

Accordingly, the College Governors instituted in October, 1949, a four years (day) Associateship in Applied Physics, recognised by the Scottish Education Department as of honours degree standard.

The course has not been planned to teach techniques since it is not designed to turn out technicians. It is designed to train students who, as well as having first class mathematical and scientific abilities, have also a practical aptitude akin to that of the engineer. It was felt that a course framed on the successful experience of the Glasgow B.Sc. degree course in engineering over the past half century would meet a need of to-day. It should be essentially a " sandwich " scheme combining the fundamental sciences of mathematics, physics and chemistry at a higher level than is required for the honours engineering degree with practical applications of physics in the College laboratories during the winter session as well as practical experience in industry during the summer recess.

There was evidence to suggest that, although large industrial establishments could employ (indeed, must employ) the most highly qualified pure physicists with an adequate technical staff to support them, there remained firms who were seriously handicapped by lack of men of first rate attainments in physics and ready to take responsibility and " get down " to their job. Sir Henry Tizard, in his Presidential Address to the British Association at Brighton, in 1948, declared his finding that what Britain lacked was not scientific knowledge, but the ability to get scientific knowledge applied *quickly*. My own visit last year to the Universities and Colleges in the United States confirmed this as I formed the opinion that the Americans were quicker than we were in getting scientific discoveries into practical application.

In fine, the course was designed to combine a broadly based foundation in mathematics and in classical physics, together with a laboratory training in the application of the principles of physics in apparatus such as the graduate might meet in his industrial life.

* Professor James Muir. *John Anderson, Pioneer of Technical Education, and the College he founded.* (John Smith and Son, (Glasgow) Ltd.)

It might be argued that a student holding an honours degree in physics could attend the fourth year of the applied physics course during a post-graduate year. (Indeed, applications have already been received from such graduates). No doubt this would be satisfactory, but it is costly in time. The Applied Physics course, including vacational training, is perhaps more intense, but it is not too severe on the student—refreshment is obtained (with an economy in time) by a change in the nature of the work. The tempo (and the discipline) is in line with the tempo advocated by Sir Henry Tizard in his British Association address.

During my recent tour of American Universities and Colleges, I formed the opinion that the Americans are also convinced of the growing need for "industrial physicists." At the present time there are courses leading to a degree in "Engineering Physics" at several of the major universities and colleges.

The plan of the course necessitated, as already stated, the provision of new laboratories and equipment. Accordingly, the following new laboratories have been provided and equipped since the Applied Physics course began.

X-Ray Laboratory.

This laboratory contains two Watson 90/30 trolley type C, and one Watson 80/15 portable type MX2 X-ray sets and one Raymax X-ray generator (100 KV., 10mA) with interchangeable targets. The crystallographic equipment comprises a 10" vacuum spectrograph, a Unicam optical goniometer, a 9 cm. powder camera, a Universal diffraction camera for Laue, oscillation, fibre and transmission photographs and a Leeds-Weissenberg camera. Among the general equipment are a Baldwin dosimeter, Ilford and S.E.1 photometers, X-ray illuminators for the examination of radiographs and for the measurement of diffraction photographs. A photoelectric microphotometer is at present under construction. The laboratory is provided with a fully equipped dark room.

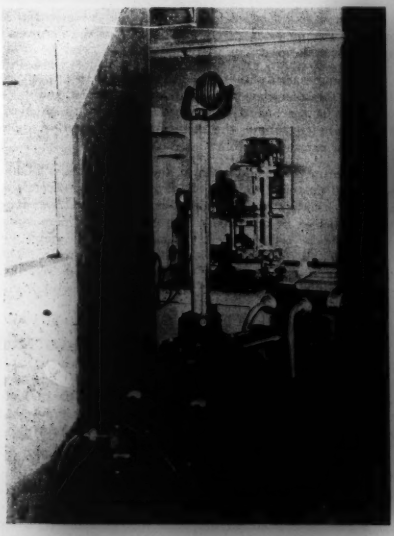

Fig. 1. *A Corner of the X-ray room showing in the background the Raymax Unit and the Leeds-Weissenberg camera.*

Electron Microscope Laboratory.

A Metropolitan-Vickers Type E.M.3 electron microscope was installed about two years ago along with ancillary equipment such as a high vacuum evaporation unit, a binocular microscope and phase control unit, a high speed centrifuge, a Hilger-Watts metal diffraction grating.

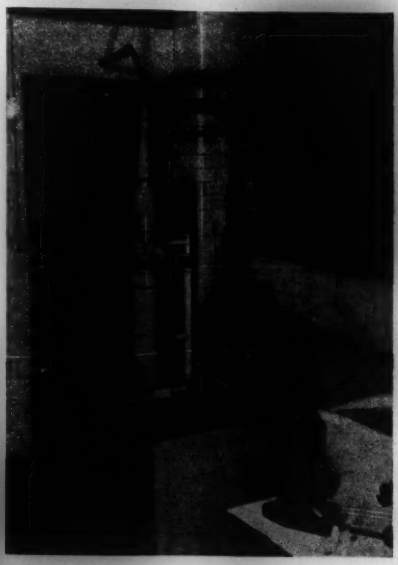

Fig. 2. *A corner of the electron microscope room.*

Vacuum Physics Laboratory.

The equipment includes several units for evaporation and sputtering and a wide range of gauges.

Current research work covers absorption and reflectivity of metallic films and properties of thin dielectric films and interference filters.

Applied Optics Laboratory.

Along with the usual optical apparatus this laboratory is equipped with a Hilger Barfit wave-length spectrometer with camera attachment for spectographic work, a Unicam S.P.600 spectrophotometer, a Lovibond-Schofield tintometer, a Bellingham and Stanley polarimeter, a Hilger refractometer (Abbé type), a Microid universal projector (for projecting

interference, diffraction, polarization and other phenomena) a 14-foot photometer bench. A 28" photometric integrating cube and a high-grade Lummer Brodhun photometer head are on order.

Photoelasticity Laboratory.

Measurements are carried out on the normal polariscope bench, but a scattered light bench is under development.

Acoustics Laboratory.

An anechoic chamber with window communicating to a smaller chamber is used for measuring transmission through panels. The larger chamber is for Rayleigh disc experiments, absolute calibration of microphones and loudspeakers, etc. An acoustical interferometer is used for measuring the velocity of sound, attenuation in tubes due to viscosity, etc., reflection and absorption coefficients of materials, acoustical impedance of horns and other sound radiators. The ancillary apparatus includes standard oscillators, a sound level meter, a wave analyser, a high-gain wide-band amplifier, etc.

Fig. 3. Interior view of anechoic chamber.

Molecular Physics Laboratory.

Work is being done on the size, shape and structure of molecules and larger particles and the relationship of these to macroscopic properties. Rheological properties are covered by a wide range of viscometers, plastometers etc. A Q meter and General Electric Schering Bridge are used for the measurement of dielectric properties. Investigations are proceeding

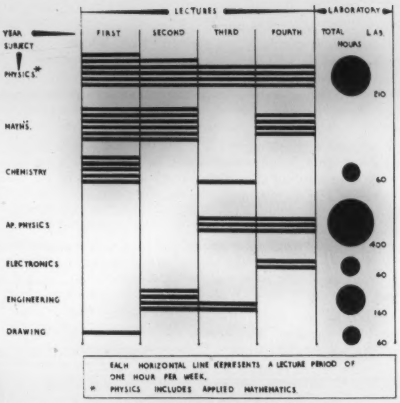

Fig. 4. Allocation of time between subjects of the College Associateship course.

on cohesion and packing of granular materials and on pressure effects in photographic emulsions.

The above chart gives some indication of how the time is allocated to the several subjects for the Associateship in Applied Physics as modified in the light of the experience gained over the past four years.

The summer term of the fourth year is devoted to the preparation of a thesis on some problem in applied physics, and it is a condition of the award of the Associateship with Honours, that the student submits this thesis to the examiners, of whom one is an external examiner as assessor.

The nature of the equipment in the applied physics laboratories and the opportunities to be provided for the encouragement of initiative in the students' practical work determine the number to be admitted to the course. The permissible annual intake is 20 students making, with allowance for withdrawals, a total of some 70 students in attendance. The number of first year entrants this session was 18, and two students will be eligible for the Associateship in August of this year.

The course, naturally, has been modified in some respects in the light of the experience gained during the four years, and it is felt that the syllabus as set out above is a sound and sensible fulfilment of the aim in view. The course has been very well received by employers and has interested the students who have come forward. It is meeting a felt want and we are greatly encouraged by its steady success and prospects.

The combination of pure and applied science in this course demands students of first-rate intellectual attainment. It is gratifying to be able to report that the course is indeed attracting this quality of student, despite the handicap that there is no degree in applied physics open to our students. It is confidently believed that this recognition will prove to be deserved by the results attained.

REPORT OF THE BOARD OF THE INSTITUTE OF PHYSICS FOR THE YEAR 1952

To be presented for adoption at the Annual General Meeting of the Institute on May 29, 1953

The Board and its Committees

The present Board took office on October 1, 1952 ; its Members are :

President : Dr. C. Sykes.

Immediate Past-Presidents : Prof. W. E. Curtis, Dr. F. C. Toy.

Vice-Presidents : Prof. E. G. Cox, Mr. O. W. Humphreys, Dr. T. L. Ibbs, Dr. J. Topping.

Honorary Treasurer : Dr. S. Whitehead.

Honorary Secretary : Dr. B. P. Dudding.

Ordinary Members of the Board : Mr. H. Barrell, Dr. N. A. de Bruyne, Mr. T. C. Keeley, Mr. G. R. Noakes, Dr. H. L. Penman, Prof. S. H. Piper, Dr. W. H. Taylor, Mr. R. G. Wood.

Chairmen of Branches in Great Britain : Dr. A. J. Maddock (London & Home Counties), Mr. W. J. Meredith (Manchester & District), Dr. T. L. Ibbs (Midland), Mr. H. G. Yates (North Eastern), Prof. J. S. Rankin (Scottish), Dr. T. V. I. Starkey (South Wales), Prof. E. C. Stoner (Yorkshire).

Appointed by Participating Societies : Dr. L. H. S. Clark (British Institute of Radiology), Mr. F. I. G. Rawlins (Faraday Society), Dr. A. B. Wood and Mr. C. G. Wynne (Physical Society), Dr. G. D. Robinson (Royal Meteorological Society).

During the year the Board met six times and appointed the undermentioned Standing and Executive Committees which held twenty-three meetings.

	Chairmen
Finance and General Purposes Committee	The Treasurer
Membership Committee - - -	Dr. J. Topping
Education Committee - - -	Dr. T. L. Ibbs
Benevolent Fund Committee - -	The Treasurer
Publications Policy Committee - -	The President
Advisory Committee of the British Journal of Applied Physics - -	Dr. T. E. Allibone
Advisory Committee of the Journal of Scientific Instruments - - -	Mr. F. Twyman
Conference and Convention Organizing Committees :—	
4th Industrial Physics Conference—Glasgow, 1952 - - -	Sir Andrew McCance
2nd Institute Convention—Bournemouth, 1953 - - - - -	Dr. B. P. Dudding
Static Electrification—London, 1953	Dr. S. Whitehead
Particle Size Analysis—Nottingham, 1954 - - - - - -	Mr. F. I. G. Rawlins.

Representatives on Joint Committees and other Bodies

The Institute has been represented as follows :

On the Royal Society's National Committee for Physics : Mr. J. H. Awbery.

On the Royal Society's National Committee for Crystallography : Prof. E. G. Cox.

On the Royal Society's Paul Instrument Fund Committee : Sir Frank Smith.

On the Joint Council of Professional Scientists : The President, Dr. S. Whitehead, and Dr. H. R. Lang.

On the Parliamentary and Scientific Committee : Dr. B. P. Dudding and Dr. H. R. Lang on the General Committee, together with Dr. A. J. Maddock and Dr. S. Whitehead at the Annual Meeting.

On the City and Guilds of London Institute's Advisory Committee on the Education and Training of Laboratroy Technicians : Mr. N. Clarke, Dr. R. S. Clay and Mr. L. Walden.

On the City and Guilds of London Institute's Advisory Committee on the Training of Instrument Mechanics and Technicians : Mr. N. Clarke.

On the City and Guilds of London Institute Exploratory Committee on Industrial Radiography : Mr. N. Clarke, Mr. F. Y. Poynton and Mr. W. E. Schall.

On the Provisional National Joint Body on the Recruitment and Training of Laboratory Technicians : Mr. N. Clarke.

On the Joint Committee with the Ministry of Education for National Certificates in Applied Physics : Dr. B. P. Dudding, Mr. E. W. H. Selwyn, Dr. J. Thomson and Dr. J. Topping.

On the Joint Committee with the Scottish Education Department for National Certificates in Applied Physics : Prof. P. I. Dee, Dr. R. S. Silver and Dr. A. G. White.

On the British Committee for Radiological Units : Mr. W. Binks.

On the Joint Committee for Chemical Analysis by X-ray Diffraction Methods : Prof. W. P. Davey.

On the Physics and Mathematics Advisory Committee of the Technical and Scientific Register of the Ministry of Labour : The President and Dr. H. R. Lang.

On the London and Home Counties Regional Advisory Council for Higher Technological Education : Mr. F. Twyman.

On the London Regional Advisory Committee on Applied Physics : Mr. N. Clarke, Mr. F. Y. Poynton and Mr. G. W. Warren.

On the Governing Body of Norwood Technical College : Mr. M. W. Thring.

On the Sub-Committee on Specialist Courses in Electrical Engineering of the Welsh Academic Board of Technology : Mr. W. S. Vernon.

On the Applied Science Advisory Committee of the Royal Technical College, Salford : Mr. D. A. Crooks.

On the Advisory Committee of the Ipswich School of Technology : Mr. H. A. Nancarrow.

On the Science Advisory Committee of Blackburn Technical College : Dr. A. Hargreaves.

On the Science Advisory Committee of Bury Municipal Technical College : Dr. G. D. Rochester.

On the East Anglian Regional Advisory Council for Further Education : Mr. H. A. Nancarrow.

On the Yorkshire Council for Further Education Advisory Committee on Applied Physics for the Leeds/Bradford/Huddersfield area : Prof. E. G. Cox, Dr. M. O. Pelton and Dr. D. L. Smare.

On the Yorkshire Council for Further Education Advisory Panel for Physics : Mr. S. L. Anderson, Dr. K. W. Andrews, Dr. M. O. Pelton and Mr. E. Wilfred Taylor.

On the Bucks County Education Committee, Slough Area Science Advisory Committee : Mr. J. Yarwood.

On the Regional Council for Further Education for the South West : Prof. S. H. Piper.

British Standards Institution : The Institute has been represented on eighteen committees of the B.S.I.

Future Development Policy of the Institute

At its July meeting the Board held a general discussion on the future policy of the Institute based upon a memorandum

which the Secretary had prepared at the Board's request. The memorandum incorporated a number of suggestions put forward by members in recent years. Among the items raised were the following :

(i) *The position of the Participating Societies.* It was pointed out that the position of the Participating Societies and their representation on the Board were now anomalous. The representatives of the four Societies each expressed the view that their Councils would agree that some measure of reform was desirable to suit the changed circumstances, but it was generally agreed that changes should not be made unless it was quite clear that they would benefit the work of the Institute and the Societies. It was pointed out that the Physical Society, being the only one of the four the majority of whose members were physicists, was in a special position and it was agreed that nothing should be done which would in any way discourage closer collaboration between the Society and Institute. Reciprocal representation on the Society's Council and Institute's Board was suggested. The Officers were asked to re-examine the position of the Participating Societies within the Institute and submit proposals to the Board in due course.

(ii) *Reading and discussion of original papers.* At one time the Board had not approved of the reading of original papers before Branch and Group meetings, believing that survey papers should be presented. This was now no longer so. It was, however, agreed that no special steps need be taken to encourage the regular reading of original papers.

(iii) *Professional activities.* It had been suggested that the Institute should be more virile in " elevating the profession of physics," but it was the general view of the Board that every appropriate opportunity of furthering this object was already being taken.

The Register

TABLE 1.—THE ROLL OF THE INSTITUTE

	Total on Dec. 31, 1951	CHANGES DURING 1952							*Total on Dec. 31, 1952*
		New	*Transfers to*	*Readmitted*	*Resigned*	*Deceased*	*Removed*	*Transfers from*	*Net Inc. or decrease*	
Honorary Fellows	4	1	—	—	—	—	—	—	+ 1	5
Fellows	900	10	26	—	5	14	—	—	+ 17	917
Associates	1,526	101	37	4	19	3	5	25	+ 90	1,616
Graduates	467	139	124	—	8	—	5	24	+ 226	693
Companions	—	—	—	—	—	—	—	—	—	—
Subscribers	459	34	—	1	21	5	25	2	— 18	441
Students	724	129	—	—	24	—	18	136	— 49	675
Total	4,080	414	187	5	77	22	53	187	+ 267	4,347

Deaths.—The Board records with regret the deaths reported in 1952 of :—

Fellows : F. W. W. Baker, T. G. Bedford, Sir James French, J. Gregory, Sir Richard Gregory, K. A. K. Hallowes, C. H. Lees, W. Lethersich, F. H. Newman, P. Parker, J. H. Roberts, E. Seddon, W. Wilson, F. B. Young. *Associates* : D. K. Ashpole, P. A. Curry, A. F. Waddington. *Subscribers* : W. H. Brown, W. J. Elford, A. E. Knight, K. B. Merling, N. Spence.

Membership Committee

During the year 651 applications for election or transfer to the various grades were received for submission to the Committee, compared with 524 applications in 1951. The numbers for the grades (with the 1951 numbers in brackets) were : Fellows 36 (37), Associates 153 (108), Graduates 287 (208), Students 141 (146) and Subscribers 34 (25).

The year has shown a good increase in membership although the number of students admitted was the lowest since the end of the war. The total of new members (i.e. not previously members of any grade) elected to grades for which approved academic qualifications in physics are demanded, was the highest since the foundation of the Institute.

The Interview Panel met twice during the year and interviewed five candidates.

Representatives of the Committee visited six technical colleges which had applied for recognition or for an extension of recognition.

General Meeting—Election of Honorary Fellow

The 32nd Annual General Meeting of the Institute was held on 5th June in the Institute's House.

At the meeting Sir Owen W. Richardson was declared elected as an Honorary Fellow.

Education

Graduateship Examination.—The Graduateship examination was held this year (June 16–19) for the first time. The written papers were taken in London (at the Institute's House) and Wigan (Mining and Technical College) and the practical examination at the Polytechnic, Regent Street, London. Twenty-four candidates had been accepted by the Examiners but three candidates subsequently transferred to the 1953 examination. Of the remaining twenty-one candidates, six satisfied the Examiners in those papers which they were required to take. The Examiners were : Professor A. M. Tyndall, Professor F. A. Vick, Dr. J. Topping, Mr. A. E. de Barr and Mr. N. Clarke.

New Reports.—The Education Committee considered the revision of the 1943 report on *The Education and Training of Physicists* and decided to replace this with two new publications. The first *The Scientific Education of Physicists* was published in March and is intended to be a guide to the facilities available in this country for professional education and training in physics. It contains factual data relating to the physics departments of all the universities and university colleges of Great Britain and of those technical colleges recognised by the Institute. It has been welcomed and there has been a steady demand for it.

The Education Committee has also held several meetings to discuss a second new report, dealing with problems and matters of policy relating to educational facilities in physics. At the end of the year the report was almost ready for publication, under the title *Problems Concerning the Education of Physicists*.

National Certificates in Applied Physics.—The numbers of candidates taking the 1952 final examinations for National Certificates in Applied Physics were 137 for the Ordinary Certificate and 33 for the Higher Certificate. The Institute's Assessors were :

England and Wales : Mr. G. R. Noakes, Dr. J. Topping and Mr. G. W. Warren. Scotland : Dr. G. Morris.

There has been a large increase in the interest shown in the Certificates and in the number of enquiries received by the Institute from employers and colleges. There should be a substantially increased number of candidates taking the examinations in 1953 and 1954. The Joint Committee of the Ministry of Education and the Institute, which is responsible for the award of the Certificates and the control of courses, made some changes in the regulations, in particular deciding that practical examinations need not in future be held as part of the final assessed examination.

Publications

The 1952 publishing programme was delayed by a variety of causes, not the least important of which was the need, in the face of rising costs, to keep expenditure within the amount voted for this purpose. The Board, advised by its Finance Committee, has continued to watch the annual growth in the expenditure on publications with some anxiety tempered by its satisfaction with the corresponding growth in the receipts from them.

The Journals.—The circulation of both Journals continued to increase steadily during the year and there was an improvement in the advertisement revenue. The third year of publication of the *British Journal of Applied Physics* increased its recognition as one of the principal Journals for the publication of important original work in applied physics.

The Board accepted the offer of the Scientific Instrument Manufacturers' Association of Great Britain Ltd. of £50 per annum for three years from its Bowen Trust Fund for the purpose of providing prizes for the best original contributions relating to scientific instruments or their use published in either of the Institute's Journals. The Trust Fund was established by the late Mr. W. Bowen, a Fellow of the Institute. The Board appointed a small committee to prepare rules for the award of the prizes and to recommend the winners.

The amount of material submitted to the Journals and published in 1952 is shown in the following table, in which the figures in brackets are those for 1951. The two years are not strictly comparable on a page for page basis as the size of type was reduced during 1952 to one giving about 15% more words to the page.

It is not always realised that the process of refereeing original papers, especially of inexperienced authors, requires considerable patience and skill and the high standard of the Journals is in no small measure due to the painstaking trouble of Fellows and others who are good enough to act as referees. The Board wishes to record its appreciation of this important service and also to thank all those who have reviewed books for any of the Institute's publications.

TABLE 2.—MATERIAL PUBLISHED IN THE INSTITUTE'S JOURNALS

	J.S.I.		*B.J.A.P.*	
	1952	1951	1952	1951
Extent of Journal text (pages)	416	(388+68 supplement)	400	(378+96 supplement)
Original papers (numbers) :				
Submitted	180	*160*	82	*77*
Accepted	120	*112*	60	*60*
Substantially modified before acceptance	70	*90*	38	*40*
Special articles and Reports published	2	*6*	14	*12*
Laboratory and Workshop Notes :				
Submitted	68	*88*		
Accepted	53	*67*		
Substantially modified before acceptance	23	*37*		
New Instruments, Materials and Tools :				
Items published	38	*28*		
Notices of manufacturers' publications	58	*64*		
Letters to the Editor published	24	*16*	11	*10*
New Books :				
No. of reviews published	22	*20*	108	*73*

Bulletin.—The monthly *Bulletin* has now become the regular medium for keeping members at home and oversea in touch with headquarters. The twelve issues contained 80 pages (compared with 88 the previous year). New features included invited articles, the publication of lists of Physical Society meetings and an annual index. The revenue from advertisements of vacancies for physicists again covered about two-thirds the cost of printing.

"*Physics in Industry*" *series*.—Professor N. F. Astbury's *Industrial Magnetic Testing* (a volume of 132 pages and 41 figures) was published in March, 1952, and was well received. *Metallurgical Equilibrium Diagrams* by Dr. W. Hume-Rothery, Mr. J. W. Christian and Mr. W. B. Pearson was published in September, 1952. This volume of 311 pages with 239 figures is the largest book yet published by the Institute itself. The script of Mr. G. P. Barnard's *Modern Mass Spectrometry* was received in June, 1952, and this important work will be published early in 1953. Mr. H. J. Woods has been commissioned to contribute the next volume in the series, *Physics of Fibres*, and further volumes are being commissioned.

Educational books and pamphlets.—At the suggestion of the Education Committee the Deputy Secretary wrote a valuable little book entitled *Physics as a Career* which gives guidance on the available avenues of training which lead to professional recognition as a physicist, together with factual information and comments on the main openings for employment. The book was published in April, 1952, and received very favourable reviews. It is proving most valuable in answering the many enquiries about careers which the Institute receives. Sales of the book have been extremely satisfactory.

The educational pamphlets published during the year were *The Scientific Education of Physicists* (see above) and the *Graduateship Examination Papers* set in 1952.

Institute Handbook.—In June a completely new edition of the Institute's handbook was published ; it contains the full regulations governing membership. The inclusion of reproductions of some excellent photographs of the Institute's House was a welcome innovation.

Memorandum on Gamma-ray Sources for Radiography.—This memorandum was originally issued in " duplicated " form for the convenience of members of the Industrial Radiology Group. The demand for copies proved so great that it was decided to print and publish it as an Institute pamphlet. The first edition was nearly exhausted by the end of the year and a new one is already in preparation.

Notes on the preparation of contributions to the Institute's Journals and other publications.—A revised and enlarged edition of these notes first issued in 1931 was published in February, 1952. The continued large demand for this pamphlet is most satisfactory and there is no doubt that it is one of the factors which has led to the substantial improvement in the presentation and preparation of the papers submitted in recent years.

Monographs for Students.—It was reported last year that the Board had decided to sponsor a series of small books suitable for students studying for the National Certificates in Applied Physics. The first four monographs in this new series will be published early in 1953, at a retail price of five shillings each. They are :

Fundamental of Thermometry by J. Ainger Hall ;
Practical Thermometry by J. Ainger Hall ;
Soft Magnetic Materials used in Industry by A. E. De Barr ;
The Magnetic Circuit by A. E. De Barr.

Further books in this series are in preparation.

Reports on New Scientific Instruments

During the year the Board " noted with pleasure " that some Committees of Groups had been active in drawing up " user specifications " which give guidance about the design of " ideal " instruments of special interest to them. It was, of course, realized that in practice it was not always possible to produce commercial instruments which conform exactly with such specifications, but the Board appreciated the great value of these specifications to instrument makers and users and decided to encourage this work.

These specifications have already led to the commercial production of prototype instruments on which individual members of the Groups have prepared confidential reports, comparing their design and performance with the " ideal " specification. After careful consideration, the Board decided that such reports should only be made available as confidential documents to members of The Institute of Physics and on the clear understanding that the responsibility for the statements contained in them attached only to the writers and that they were not writing on behalf of any Group or section of the Institute or the Institute as a whole.

Professional Matters

Insurance premiums.—An Associate reported the charging of an additional life insurance premium on account of a supposed occupational hazard as a " research physicist." While a satisfactory solution was reached in this instance through the good offices of the Institute, the Board has ordered a full investigation into the whole position in view of the growing use of X-rays and radioactive isotopes, which some insurance companies consider involve greater hazards than are normally met with in physical laboratories.

Scientists' visas.—The Board has again received a few complaints about the difficulties and delays experienced in obtaining visas. It has made enquiries about the cases brought before it but has been unable to take any useful action beyond advising members contemplating travelling abroad or inviting foreign guests to conferences, to see that applications for visas are made several months in advance.

Supply and demand for physicists.—In considering the report of its representatives on the Physics and Mathematics Advisory Committee of the Ministry of Labour Technical and Scientific Register, the Board expressed concern about the continuing shortage of physicists and their uncertainty whether their services were always being utilized in the best interests of the country. Further statistical information was called for but that obtained proved insufficient to enable any firm conclusions to be drawn. It appeared, moreover, that neither the Government Departments concerned, nor the University authorities had sufficient data. It was therefore decided that over the next few years the Institute should itself attempt to obtain sufficient reliable data about the occupation of new graduates to enable regular statistical reports to be prepared.

Salary Statistics.—The Board authorised the collection of information from Members during 1953 in order to prepare a new report on salaries received by Members. The two previous enquiries conducted by the Institute were in 1948 and 1951 and the data obtained have been of great value to members and employers but are now considered to be an unreliable guide to present salaries.

Deferment of Military Service.—At the request of the Institute the Ministry of Labour and National Service has agreed to defer the call-up for military service of candidates studying for the Institute's Graduateship Examination. This concession will be extended to full-time or part-time students (including holders of the Higher National Certificate in Applied Physics who wish to study an additional year for the papers they are required to take), provided that the course is approved by the Institute and a certificate to this effect issued to the candidate. The Institute will require that the course of study shall be followed in a technical institution approved by the Institute for the purpose of its membership regulations.

The Institute and Government Departments

The Board is glad to record that its assistance and advice continues to be sought by Government and official bodies. The honorary and permanent officers have close contacts with senior officials of various Ministries and the Board wishes to record its appreciation of the co-operation of these officials.

Civil Defence

At the request of the Home Office, the attention of Fellows, Associates and Graduates was called to the need for physicists in various capacities in civil defence.

The difficulties which had been met with in recruiting scientists for civil defence and their comments on the methods of training were discussed at a joint meeting held in London of the local Branches of The Royal Institute of Chemistry, The Institute of Physics, together with The Institute of Biology which was addressed by representatives of the Home Office (a report on the meeting was published in *Nature* for December 6). Pending the promised meeting between representatives of the three professional bodies and of the Home Office, the Board instructed the Secretary on the replies to be given to specific enquiries received from members about their volunteering for civil defence duties in their professional capacity.

The Institute's House

The Institute is again indebted to Mr. R. S. Whipple for substantial help in furnishing the House. In February he generously made a donation of £500 to the Furnishing Fund (which is still open for gifts in money or in kind) indicating that it was his wish that this should be used mainly to cover the cost of stair carpets and floor coverings for the entrance hall.

Some further essential repairs, partly arising from war damage were carried out, but there still remains much to be done before the full benefit can be derived from this beautiful house.

The number of meetings held in the House during the year compared with the previous year (shown in brackets) is given in the following table.

Institute meetings

Board and Committee meetings (including Branch and Group Committees)	73 (80)
Lecture meetings and conferences	27 (27)

Other meetings

The rooms have also been used by other bodies as follows :

Committee meetings	15 (19)
Lecture meetings	11 (12)

In addition, the Institute's first Graduateship examination was held in the lecture room from June 16–18.

The use of the House for non-residential purposes has to be licensed by the London County Council under the Town and Country Planning Act. The original 7-year licence which was due to expire at the end of this year was renewed for a further 14 years. The Institute's lease of the House expires in 1983.

Library

The Institute's representatives on the Joint Library Committee with the Physical Society were asked to report upon desirable changes, if any, in the arrangements for the control and use of the Joint Library. On the recommendations of these representatives and with the appreciative agreement of the Council of the Physical Society the Board has made a gift to the Society of the shelving, books and periodicals at Lowther Gardens which have been provided by the Institute. The Library has been renamed " The Physical Society Library." Members of the Institute who occasionally wish to use its facilities are invited by the Society to do so. The Institute's representatives have been invited to continue to serve in their personal capacities on the Library Committee.

Meetings on Nuclear Physics

During the year the Board gave consideration to a suggestion that the Institute, perhaps in co-operation with other bodies such as the Physical Society, should hold periodical conferences or symposia on nuclear physics. After consideration with leading physicists working in this branch, and hearing a report on the views expressed at a special session of the Physical Society meeting held in the University of Glasgow in July, it was decided that the present informal *ad hoc* arrangements sufficed. It is intended, however, to keep members informed of these meetings by notices in the *Bulletin* and the Branches are considering the inclusion in their programmes of occasional lectures on applications of nuclear physics in industry and cognate subjects.

Protection from Radiation

The Industrial Radiology Group submitted a memorandum to the Board on " Radiation Protection in Industrial Radiology," strongly urging that the Protection Committee set up under the Radioactive Substances Act should issue regulations and that these or similar regulations should be enforced under the Factories Act.

The Board raised the matter with the Chief Inspector of Factories and ordered that a notice should be inserted in the *Bulletin* (December issue) calling attention to the need to take simple precautions against risks to health arising from the absorption of radiation. A short bibliography of information was included in the notice as well as the addresses from which further information could be obtained.

Conferences and Conventions

4th Conference on Industrial Physics.—Before the war a series of " Physics in Industry " conferences were held, the object of which was " to promote the application of physics to industry by bringing to the attention of industrial executive engineers and scientists recent developments in applied physics and by providing opportunities for the interchange of ideas with and among professional scientists." The fourth conference in the series took place in Glasgow from June 25–28, 1952, the theme being " Physics in the transport, shipbuilding and engineering industries." Nearly 400 people attended the conference of which only 128 were members of the Institute.

The conference was formally opened by the Rt. Hon. Lord Bilsland, President of the Scottish Council, and was presided over by Sir Andrew McCance. The programme included the following lectures which were followed by discussions on them : " Physics in the service of metallurgy " by Sir Andrew McCance ; " Meteorology in industry " by Sir Robert Watson-Watt ; " Some applications of physics in naval architecture " by Professor A. M. Robb ; " Some applications of physics in transport " by Mr. M. G. Bennett and Mr. T. A. Eames ; " Automatic control of industrial processes " by Mr. A. J. Young ; and " Noise and its suppression " by Mr. N. Fleming. Mr. D. T. N. Williamson gave a public address on " Physics and sound reproduction." Several hundred people attended this and it was illustrated by fascinating demonstrations. On one afternoon of the conference there was a discussion on " The Education and training of industrial physicists in Scotland." The opening speakers were Dr. J. Taylor, Professor P. I. Dee and Professor J. S. Rankin.

Visits were made to a number of laboratories and works in the district and some visits to local beauty spots were also arranged. The Lord Provost and the Corporation of the City of Glasgow were good enough to arrange a reception and dance for conference members and their ladies.

An exhibition of apparatus, instruments and books cognate to the subject of the conference was held in the Royal Technical College which was also the seat of the conference. Seventy-five firms, Government departments and Research Associations were represented at the exhibition. The local arrangements were in the hands of Mr. A. Buchanan Campbell. A Catalogue of the exhibition and a Handbook of the conference were published and the whole of the expenses of the conference were covered by the generous support of the Catalogue by exhibiting firms.

At the official Conference luncheon the guests included the Earl and Countess of Balfour, Sir Andrew and Lady McCance, Sir Nelson Johnson, Sir Robert Watson-Watt and Sir Patrick Dollan, together with representatives of the local education and Civic authorities and of the University and The Royal Technical College. Attention was paid to the conference in both the lay and technical press and it was particularly well treated by the Scottish papers. There was a short broadcast talk on it in the Scottish regional programme.

Apart from the many valuable contacts which were made and renewed between physicists and industrialists, the Organizing Committee was satisfied that the conference had served its primary object of bringing to the attention of the leaders of local industries the importance of physics and its applications in their respective fields.

The Board wishes to place on record its grateful thanks to Sir Andrew McCance, the Chairman of the Conference Executive Committee, to Professor J. S. Rankin, Chairman of the Local Committee, and to Mr. T. H. O'Beirne, the local Honorary Conference Secretary, each of whom contributed substantially to the success of the conference. It also wishes to record its thanks to the Director, Dr. D. S. Anderson, and Governors of the Royal Technical College for their generosity in allowing the conference and exhibition to take place in the College.

Conferences and Convention in preparation.—The arrangements for the conference on " Static Electrification " which is to take place in March 1953 were almost completed during the year under review and the scripts of several contributions were received before the end of it. The Proceedings of the Conference will form the 2nd Supplement to the *British Journal of Applied Physics*.

The Board accepted the suggestion made by some Fellows that the Institute should arrange a conference on " Particle Size Analysis " and it set up an Organizing Committee which has made good progress with its work. The conference has now been arranged to take place from April 6–9, 1954, in the University of Nottingham.

In January 1952 the Board decided that the next Institute Convention should be held in 1953 along lines similar to that held in Buxton in 1949. An Organizing Committee was set up. The Convention is to be held in Bournemouth from May 27–30, 1953. During the year the complex arrangements necessary for the success of such a function made good progress and the Board is particularly grateful to the Group Committees for their close collaboration and support.

Branch and Group Conferences.—The several conferences arranged by the Branches and Groups are reported below.

Annual Conference of Branch and Group Officers

The ninth Annual Conference of Honorary Officers of Branches and Groups was held at the Institute's House on May 14, 1952, the President (Professor W. E. Curtis) being in the Chair. Twenty-four honorary officers attended. The matters discussed included the desirability of more regular opportunities for the reading of original papers, the general arrangements for the next Institute Convention, the growth of membership and library facilities. Several recommendations were submitted to the Board.

Activities of the Branches and Groups

Australian Branch.—President : Professor L. H. Martin. *Honorary Secretary :* Associate Professor E. O. Hercus. *Honorary Treasurer :* Dr. J. S. Rogers. (333 members).

The Divisions of the Branch in the different States have held regular monthly meetings and two inter-State meetings have also been held. A four-day Microscopy Conference and Exhibition was held in Melbourne in February. In August the New South Wales Division organized an exhibition of scientific instruments at the time of the Sydney meeting of the Australian and New Zealand Association for the Advancement of Science.

Indian Branch.—President : Sir C. V. Raman. *Honorary Secretary :* Dr. H. P. Warran. (84 members).

The Branch Committee has advised the Membership Committee on several applications received from India.

London and Home Counties Branch.—Chairman : Dr. A. J. Maddock. *Honorary Secretary :* Mr. B. S. Cooper. (1,797 members).

Six lecture meetings were held in London and one in Reading. A visit was arranged in July to the Road Research Laboratory at Harmondsworth.

Manchester and District Branch.—Chairman : Mr. W. J. Meredith. *Honorary Secretary :* Dr. A. Hargreaves succeeded by Dr. C. C. Butler. (413 members).

Five lecture meetings were held at the University of Manchester. A one day conference on Textile Physics was also held at the University of Manchester in October.

Midland Branch.—Chairman : Dr. T. L. Ibbs. *Honorary Secretary :* Mr. W. C. Hynd. (350 members).

Five meetings were held in Birmingham. A visit was arranged to the Laboratories of the British Thomson Houston Co. Ltd., in January and a visit to Chance Brothers Ltd., in December.

Scottish Branch.—Chairman : Professor J. S. Rankin. *Honorary Secretary :* Mr. J. McNeill. (308 members).

Nine meetings were held in Glasgow, six in Edinburgh, three in Dundee and one at St. Andrews. Also, a course of eight lectures was arranged at the University of Glasgow on the development of concepts of physical science and another course of seven lectures was arranged at the University of Edinburgh on semiconductors.

The Branch Committee acted as the Local Executive Committee for the 4th Conference on Industrial Physics which was held in Glasgow (see page 43) and the Board wishes to record here its appreciation of the work carried out by the Branch in this connection.

South Wales Branch.—Chairman : Dr. T. V. I. Starkey. *Honorary Secretary :* Mr. M. R. Hopkins. (216 members).

Three meetings were held in Cardiff, two in Swansea and one in Aberystwyth.

North Eastern Branch.—Chairman : Mr. H. G. Yates. *Honorary Secretary :* Dr. N. Thorley. (96 members).

Four meetings were held in Newcastle, one at Durham and one at Sunderland jointly with the Electronics Group.

Yorkshire Branch.—Chairman : Professor E. C. Stoner. *Honorary Secretary :* Dr. R. S. Tebble. (190 members).

The Branch held the Inaugural Meeting at the University of Leeds on October 15.

Education Group.—Chairman : Mr. W. Somerville Vernon. *Honorary Secretary :* Dr. J. Topping succeeded by Mr. F. Y. Poynton. (251 members).

Four meetings were held in London, one of which was organized with the Acoustics Group of the Physical Society. The Annual Group Conference was held in London on April 17–19, the subject being " School and University Examinations in Physics." A visit was arranged in July to Christ's Hospital, Horsham.

Electronics Group.—Chairman : Mr. H. G. Hughes succeeded by Mr. G. W. Warren. *Honorary Secretary :* Mr. G. W. Warren succeeded by Mr. S. Rodda. (314 members).

Six meetings were held in London and one at Sunderland jointly with the North-Eastern Branch. The Summer

meeting was held in July at the Clarendon Laboratory, Oxford.

Industrial Radiology Group.—Chairman : Mr. C. Croxson succeeded by Mr. W. E. Schall. *Joint Honorary Secretaries :* Mr. R. Meakin and Mr. B. N. Clack succeeded by Mr. B. R. Byrne. (240 members).

Five lecture meetings were held in London ; a visit to the X-ray Department of Guy's Hospital was arranged in November. A three-day Summer Meeting was held in July in Sheffield.

X-ray Analysis Group.—Chairman : Dr. W. H. Taylor. *Honorary Secretary :* Mr. A. E. de Barr succeeded by Mr. E. J. W. Whittaker. (353 members).

The three-day Spring Conference of the Group was held jointly with the Scottish Branch in Edinburgh in April. At the Royal Institution in October the Group held a two-day Conference and Dinner to celebrate the 40th Anniversary of the Discovery of X-ray Analysis. Professor von Laue was the principal guest.

Work has been continued at the University College, Cardiff, under the direction of Dr. A. J. C. Wilson, on the extension of data for the card index of diffraction data published by the American Society for Testing Materials. During the year arrangements were made for the despatch of a stock of the new edition of the Cards to the Institute for distribution from its London headquarters.

The Equipment Sub-Committee and its Panels have continued their work. Arrangements have been completed to make available a wide range of graphical charts and nets in common use in crystallography. Some reorganization and discussion of objectives has taken place, to ensure the greatest benefit to the Group of the Sub-Committee's efforts.

Industrial Spectroscopy Group.—Chairman : Mr. D. M. Smith. *Honorary Secretary :* Mr. J. R. Stansfield. (145 members).

Three meetings were held in London. The 3rd International Spectroscopy Colloquium, organized by the Group was held at High Leigh, Hoddesdon, 170 people attending from 13 countries.

Electron Microscopy Group.—Chairman : Professor W. T. Astbury. *Honorary Secretary :* Mr. F. W. Cuckow succeeded by Dr. R. Reed. (221 members).

The Group held its annual Conference at the University of Bristol.

Stress Analysis Group. Chairman : Colonel H. T. Jessop. *Honorary Secretary :* Mr. E. K. Frankl. (123 members).

The Group held a three-day conference in London and meetings in Nottingham, Birmingham and Leeds. (Visits to the Civil Engineering Department at Birmingham and the Physics, Civil and Mechanical Engineering Department at Leeds were organized in connection with these meetings.) A summer school in photoelasticity was held at University College, London.

Acknowledgments

Branch and Group Officers.—The Board wishes to record its thanks to those members who have acted as Honorary Officers of the Institute's Branches and Groups and who have thereby contributed greatly to the Institute's activities.

Meeting Rooms and Visits.—The Board records its thanks to the following bodies which have generously allowed meetings of the Institute's Branches and Groups to be held on their premises or which have allowed visits to their laboratories : British Thomson Houston Co. Ltd., Rugby ; Chance Brothers Ltd., Smethwick ; Christ's Hospital, Horsham ; Clarendon Laboratory, Oxford ; Crewe Hall, Sheffield ; Gas Showrooms, Nottingham ; Guy's Hospital, London ; High Leigh, Hoddesdon ; King's College, Newcastle-upon-Tyne ; The Royal Institution ; Road Research Laboratory, Harmondsworth ; Technical College, Sunderland ; the College of Technology, Cardiff ; the College of Technology, Birmingham ; the Universities of Birmingham, Bristol, Durham, Edinburgh, Glasgow, Leeds, Manchester, Reading, St. Andrews ; the University Colleges of Aberystwyth, Cardiff, Dundee, London, Swansea. The Board also wishes to thank the Principal of the Wigan Mining and Technical College and the Director of Education, The Polytechnic, Regent Street, London, for permission to hold the Graduateship examination in these colleges.

Finance

The 1952 accounts are presented in the same general form as last year, but the basis of allocation of overheads (salaries, wages, cost of running the House, office, printing and stationery etc.) has been made to correspond more closely to the distribution of effort ; consequently the corresponding figures for 1951 cannot strictly be compared with those for 1952. About three-quarters of the Institute's work is, for financial purposes, now reckoned as coming wholly within the activities of the Endowment Trust Fund—a charity owned entirely by the Institute—and it is intended from time to time to transfer some of the surpluses on the Institute's account to the Fund in support of the scientific and educational work which it carries out for the Institute. As the combined surplus from the Institute's publications business and the Glasgow Conference was about equal to the cost of the educational and other work, the Trust Fund account nearly balances. The Board therefore decided this year to use the surplus on the Institute's account to help build up its seriously depleted reserves—a policy decided upon four years ago when the subscriptions were raised partly for this very purpose.

The Institute of Physics accounts. The Institute's income and expenditure account does not call for detailed comment beyond the remarks made above. It is satisfactory to record that this year there is an increase in the Institute's assets. The current liabilities are about the same as last year, the expenses item being the items belonging to the last quarter of 1952 which were not actually paid or transferred to the other accounts until after the turn of the year. The X-ray diffraction index fund is held on trust for the X-ray Analysis Group (see appendix). For some years the subscriptions collected in Australia were retained there, in the hope that the exchange rate would improve ; it will be noted that during the year most of the investments held in Australia were realized (£2,655 Sterling) and the proceeds transferred to London where they were for the most part put on deposit.

Endowment Trust Fund accounts. It has already been remarked that the 1952 figures cannot strictly be compared with those for the previous year owing to the change in the basis of allocating overhead and labour charges between the accounts. The Board wishes to record its grateful thanks to the firms and other organizations which took part in the Glasgow Exhibition for their generous support of the advertising space in the catalogue ; it is this which has enabled the Conference account to show a welcome surplus. The Board also wishes to record its thanks to those firms who made further donations to the Trust Fund during the year and to the Royal Society for a subvention of £500 from the Parliamentary Grant-in-Aid for Scientific Publications. The stock on hand of publications

has increased by £3,349 to £7,056 ; it will therefore be observed that taking the Institute's affairs as a whole (i.e. combining the two accounts) the whole of the surplus on the year has been ploughed back into publications stock—mostly books. This process is to be allowed to continue in 1953 but the Board has ordered that thereafter the value of the stocks held is not to increase further. It is considered prudent to put back to reserve the whole of the proceeds of the sales of books until their cost of production has been written off ; accordingly a sum of £653 has this year been taken for stock depreciation reserve. As in previous years the main part of the sundry debtors item is for invoiced subscriptions to the 1953 volumes and that portion of it is, of course, also included on the other side as " Publications subscriptions received in advance."

Benevolent Fund

The Fund received an anonymous donation of £1,000 from a Fellow during the year, and the Fund Committee wishes to record here its grateful thanks to him for this donation. It also thanks the several other members who have made donations and those responsible for the books which brought in royalties of £162.

A weekly allowance made to the widow and children of an Associate was continued and grants were made to three members who were in indifferent health.

The Fund Committee still feels that the capital of the Fund should be a good deal larger in order to meet any unexpected calls upon it and again expresses the hope that more members will support the Fund.

APPENDIX

Parliamentary and Scientific Committee.—The General Committee met eight times during the year and heard addresses on scientific matters of public interest, which were then discussed. These included addresses on " The shortage of science teachers and its consequences," one of the opening speakers being Professor W. E. Curtis, then President of the Institute. Subsequent to this meeting a number of questions were asked by members of the Committee on this subject in the House. Other subjects which have been discussed following addresses are the " Management and the better use of science and technology in industry " and " Application of research in the steel industry." The Committee was fortunate in hearing addresses by Dr. James Conant on " Anglo-American Scientific Relations " and by the Lord President of the Council on the main activities of the Government organizations concerned with research and technology. The latter prompted the President of the Committee, Viscount Samuel, to put down a Motion in the House of Lords for debate. So many Peers wished to participate that two full days, June 11 and 12, were devoted to it. On July 16 the General Committee discussed the main points that had arisen in this debate and the Lord President received a deputation from the Committee on July 28 to give further consideration to the matters that had been raised. Throughout the sessions, members of both Houses who are members of the Committee have pressed the responsible Ministers for information and action on scientific and technological matters which have been brought to the attention of the General Committee. In these several ways the Committee continues to be a useful liaison between the professional scientific organizations and Parliament.

Joint Council of Professional Scientists.—The Joint Council, acting as a joint consultative body of four professional Institutes, discussed among other matters the shortage of science teachers in schools, superannuation schemes and press statements about scientists and politics. During the year the secretariat of the Joint Council was transferred from The Institute of Physics, which had provided this service for the past ten years, to The Royal Institute of Chemistry.

Royal Society's National Committee for Physics.—The Committee has held two meetings during the year. The International Union of Pure and Applied Physics, of which it acts as the British element, will hold its next general assembly in London in July 1954, and arrangements for this have occupied a good deal of attention.

The International Abstracts Board, set up by the Union, has made great progress, and is being urged to include chemistry in its scope. It is likely to be asked to consider the question of admission of a German abstracting journal to the International Group.

British Committee for Radiological Units.—During the past year, the British Committee for Radiological Units has had under consideration the preparation of a statement for submission to the International Commission on Radiological Units, advocating changes in certain sections of the current (1950) Recommendations of the Commission. In Section A it is recommended that " dose be expressed in terms of the quantity of energy absorbed per unit mass (ergs/g) of irradiated material at the place of interest." Since it seems unlikely that there will be any further important change in the fundamental unit, it is desirable that this unit should now be introduced into subsequent sections of the Recommendations dealing with the specification of the conditions of X-ray and gamma-ray treatment.

Royal Society's Paul Instrument Fund Committee.—The Committee met three times during the year. The number of grantees for the development of novel types of scientific instrument is now seven.

City and Guilds of London Institute Exploratory Committee on courses for radiographers.—The full committee held its first meeting in December (at the Institute's House) and agreed to recommend that courses and examinations for industrial radiographers should be established. A sub-committee was appointed to frame draft regulations and syllabuses and has already met.

City and Guilds of London Institute Advisory Committee on Laboratory Technicians Courses.—The course leading to the Intermediate Certificate in Laboratory Technician's work is gradually becoming known and recognised. In 1952, 37 candidates took the examination but only five of them specialized in physics laboratory techniques (compared with 17 in chemistry). It is encouraging, however, to find that 12 technical colleges have now scheduled courses for the certificate.

A scheme and syllabuses have now been drafted for a Final Certificate.

It is a disappointment to some members of the Advisory Committee to record that a decision has recently been taken that technicians in the University of London should study for the examinations of the Science Technologists' Association rather than for those of the City and Guilds of London Institute.

The Governing Body of Norwood Technical College.—Three meetings of the Governing Body were held during the year 1952. The demand for courses in preparation for examinations such as Inter-B.Sc. and the General Certificate of Education (Advanced Level) was even heavier than in the preceding session. Included in the College curriculum are numerous

lecture-demonstrations dealing with various branches of pure and applied science. Since many visitors to the College had expressed interest in these activities it was decided to make them available to science-side students of Grammar and similar schools. The subjects were chosen from the fields of chemistry, physics, biology and electronics. The response was most encouraging, most of the lectures having to be repeated once and in some cases twice in order to cater for all the applications received.

It was regretted that an application by two members of the teaching staff for relief from teaching duties for a stated number of hours each week in order to undertake research work was rejected, the Education Officer stating that the essential value of the proposed researches would not be commensurate with their cost to the Local Council.

Sciences Advisory Committee to the Governing Body of the Slough College for Further Education.—This new Committee has met twice during the past year and has already done some useful work. The College is inadequately equipped both as regards laboratory space and apparatus. The Committee has strongly advised the Governors as well as the Buckinghamshire Education Committee that the situation prevailing demands immediate remedy. In the new College building that is proposed it has therefore requested that the space to be provided for extra laboratories should not—as has been suggested—be a replacement of any of the existing laboratories but should be in addition to them. Again, the Committee has put forward a strong plea that the amount of equipment for physics teaching be increased so that students can do individual laboratory exercises ; at present most practical physics is taught by demonstration only.

It has been suggested that courses for the Ordinary National Certificate in Applied Physics be started. The equipment is only suitable for the first year of such a course at present. However, it seems likely that such courses will begin in the near future. The questions of preliminary science courses and extra-mural lectures have also been considered.

Science Advisory Committee of Blackburn Technical College.—The Committee discussed a report by the Head of the Science Department. In co-operation with the local Hospital Board the Science Department will run a new course in physics for radiographers.

British Standards Institution Committees

Instrument Industry Standards Committee.—The Committee held one meeting and reviewed the work of its several sub-committees dealing with the standardization of certain instruments or parts of instruments and with proposals for new work.

Committee on Units and Symbols Standards.—The Committee has met regularly, its main activity being to co-ordinate the work of other B.S.I. committees concerned with units and symbols and to co-operate with the International Standards Organization, which has its headquarters in Copenhagen, and held a meeting on quantities, symbols, units and conversion tables in October.

Technical Committee on Abbreviations and Symbols.—The Committee's main work has been the preparation of a new British Standard "Letter Symbols, Abbreviations and Signs of common interest in physics, chemistry and engineering." The conflicting requirements of clarity, consistency with International proposals, the limitation imposed by available and convenient printing founts, not to mention the diverse views of the many bodies represented on the Committee, has caused the work to be arduous and exacting. The Committee owes much to the labour and wise guidance of its Chairman, Dr. H. J. T. Ellingham, for during the year it succeeded in completing a final draft of this specification. It should prove of the greatest help to authors, editors and printers.

Technical Committee on Electric Nomenclature and Symbols.—The preferred list of symbols has been issued by the I.E.C. and work continues on a vocabulary of electrical and electro-technical terms. Terms used in telecommunication industries is now the province of the Telecommunications Industry Committee. The International Standards Organization has set up a committee on terminology.

Sub-Committee on Terminology of Radiology.—The work of this Sub-Committee is proceeding steadily and smoothly. The Glossary is being drafted in some twenty sections. Thirteen sections have been completed and revised after a limited circulation to physicists and radiologists. Three other sections are at present under consideration, leaving four sections outstanding.

Sub-Committee on Terminology of Casting Defects revealed by Radiography.—At the end of the year the draft specification, complete with copies of radiographs, had been drawn up ready for circulation early in the new year. It is expected that the Committee's work will be completed and the Standard Specification issued in the early months of 1953.

Technical Committee on Examination of Welded Joints.—The object of this Committee is to prepare a Code of Practice giving suitable radiographic techniques for the examination of butt-welded joints in all branches of the welding industry. The recommendations should provide satisfactory standards of technique for some time to come, and will be valuable to various authorities in preparing specifications. They should also be of value to students of radiography. The recommendations are now ready for circulation to industry for comment, before issuing as a B.S.I. Code of Practice.

Sub-Committee on Radioactive Sources and Source-Holders.—It has been agreed to prepare a British Standard for radio-active source-holders. Pile-made gamma sources for industrial radiography as made at Harwell are already in wide circulation. Some of these will retain appreciable activities for many years. A change, therefore, from the existing Harwell design would introduce difficulties and hazards which to the Committee seemed impracticable, although it might have been slightly improved. For radon source-holders the aim is to provide a design which will allow the same remote handling equipment to be used as for pile-made radioisotopes.

Sub-Committee on Dimensions of X-ray Films.—This Committee discussed proposals for a British Standard for dimensions of X-ray films for crystallography. A draft specification was agreed. In the late autumn the draft was circulated to industry and various research establishments for comment.

C. SYKES,
President.

S. WHITEHEAD,
Honorary Treasurer.

H. R. LANG,
Secretary.

B. P. DUDDING,
Honorary Secretary.

THE INSTITUTE OF PHYSICS

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST DECEMBER, 1952

1951		£	£
	To Office and General Expenses :—		
4,235	Salaries and National Insurance	2,640	
280	Staff Superannuation	90	
1,686	Rent, Rates, Heating, Cleaning, Maintenance, etc....	666	
552	Board Committees' and Officers' Travelling Expenses	636	
1,051	Printing and Stationery	555	
642	Postage and Telephones	254	
423	Miscellaneous Expenses	192	
8,869			5,033
311	,, Depreciation of Furniture and Fittings		320
1,679	,, Copies of Journals supplied to Members		1,814
	,, Amount written off Expenditure on Alterations, Improvement and Adaptation of House		
469			515
985	,, Leasehold Redemption Policy		985
	,, Balance being Excess of Income over Expenditure carried down		
—			3,664
£12,313			£12,331

93	To Balance brought down		—
—	,, Balance brought forward from previous year		92
—	,, Balance carried down		3,572
£93			£3,664

1951			£
9,968	By Members' Subscriptions		10,283
460	,, Entrance and other Fees		638
115	,, Dividends and Interest less Tax		132
	,, Contribution by the Endowment Trust Fund towards Administration of Educational and Scientific Work		
513			—
	,, Contribution from Endowment Trust Fund for :—		
	Alterations, etc., of Premises	£300	
	Depreciation of Furniture and Fittings and Leasehold Redemption Policy :		
	Charged to cost of Publications	£652	
	Charged to other work	£326	
1,164			1,278
	,, Balance being Excess of Expenditure over Income carried down		
93			—
£12,313			£12,331

—	By Balance brought down	3,664
1	,, Balance brought forward from previous year	—
92	,, Balance carried down	—
£93		£3,664

BALANCE SHEET, 31st DECEMBER, 1952

1951			
£		£	£
	LIFE MEMBERSHIP FUND :—		
	As at 31st December, 1951	5,158	
	Less : Transfer to Reserve Fund in respect of deceased members	105	
5,158			5,053
	RESERVE FUND :—		
	As at 31st December, 1951	2,132	
	Add : Transfer from Life Membership Fund ...	105	
2,132		2,237	
92	*Add* : Income and Expenditure Account Balance	3,572	
			5,809
1,970	SINKING FUND (Leasehold Property)		2,955
	FURNISHING FUND :—		
—	Donation	500	
—	*Less* : Expenditure to date	429	
			71
	CURRENT LIABILITIES AND PROVISIONS :—		
476	General Subscriptions received in advance	555	
4,569	X-ray Diffraction Index	5,112	
3,289	Endowment Trust Fund	—	
1,765	For Expenses	2,543	
383	Balance at Bank overdrawn	—	
			8,210
£19,650			£22,098

C. SYKES,
President.

S. WHITEHEAD,
Honorary Treasurer.

1951			
£		£	£
	FIXED ASSETS :—		
	FURNITURE, FITTINGS AND OFFICE EQUIPMENT :—		
	At cost	4,149	
	Additions during the year	113	
		4,262	
	Less : Amount written off to 31.12.51	2,044	
	do. for year to 31.12.52...	320	
		2,364	
2,105			1,898
	ALTERATIONS, IMPROVEMENTS AND ADAPTATION OF PREMISES :—		
	At cost	9,390	
	Additions during the year	900	
		10,290	
	Less : Amount written off to 31.12.51	2,213	
	do. for year to 31.12.52...	515	
		2,728	
7,177			7,562
	INVESTMENTS :—		
	£500 3% Defence Bonds	500	
	£1,000 3% Savings Bonds, 1960/70	1,000	
	£500 2½% Defence Bonds	500	
	£660 13s. 7d. 3½% Commonwealth of Australia Stock, 1965/69	737	
	£200 Commonwealth of Australia Savings Certificates...	164	
	(*Estimated Market Value on 31st December, 1952, £2,566.*)		2,901
5,640			
1,970	SINKING FUND : Leasehold Redemption Policy		2,955
	CURRENT ASSETS :—		
634	STOCK ON HAND—Stationery	502	
246	SUNDRY DEBTORS	344	
244	SUBSCRIPTIONS DUE	242	
—	ENDOWMENT TRUST FUND	1,996	
	BALANCE AT BANK :—		
—	Current Account	581	
1,027	Deposit Account	2,072	
574	In Australia	1,032	
33	CASH IN HAND	13	
			6,782
£19,650			£22,098

Report of the Auditors to the Members of The Institute of Physics.

We have obtained all the information and explanations which to the best of our knowledge and belief were necessary for the purposes of our audit. In our opinion proper books of account have been kept by the Institute, so far as appears from our examination of those books and proper returns adequate for the purposes of our audit have been received from branches of the Institute not visited by us.

We have examined the above Balance Sheet and annexed Income and Expenditure Account which are in agreement with the books of the Institute.

In our opinion and to the best of our information and according to the explanations given to us the said accounts give the information required by the Companies Act, 1948, in the manner so required and the Balance Sheet gives a true and fair view of the state of the Institute's affairs as at 31st December, 1952, and the Income and Expenditure Account gives a true and fair view of the excess of Income over Expenditure for the year ended on that date.

Spencer House, South Place, London, E.C.2.
18th February, 1953.

KNOX, CROPPER & Co., *Chartered Accountants.*

THE INSTITUTE OF PHYSICS ENDOWMENT TRUST FUND

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST DECEMBER, 1952

1951				1951			
£		£	£	£		£	£
209	To Graduates and National Certificates Examinations		321	206	By Fees for National Certificates		225
1,385	,, Expenses of Branches and Groups		1,608	366	,, Donations		164
50	,, Conference Expenses		116	49	,, Interest		49
—	,, Glasgow Conference Expenditure		2,573	51	,, Income Tax recovered		20
90	,, Educational Booklets and Reports		113	21,870	,, Receipts from Publications		27,925
	,, Cost of Production and Distribution of Publications sold	£22,555		500	,, Scientific Publications Grant (per Royal Society)		500
	Add : Books, stock depreciation reserve	653		—	,, Glasgow Conference Income		3,563
19,119			23,208	—	,, Balance carried to Endowment Trust Fund		342
523	,, Proportion of overhead charges in connection with the work carried on by the Trust		4,223				
300	,, Contribution to cost of repairs and alteration of House, amount written off		300				
432	,, Contribution to depreciation of furniture and Leasehold Redemption Fund		326				
934	,, Balance carried to Endowment Trust Fund		—				
£23,042			£32,788	£23,042			£32,788

BALANCE SHEET 31ST DECEMBER, 1952

	£	£		£	£
ENDOWMENT TRUST FUND :—			INVESTMENTS :—		
As at 31st December, 1951	6,973		£400 3% Savings Bonds, 1965-75	400	
Less : Transfer from Income and Expenditure Account	342		£1,500 2½% Defence Bonds	1,500	
		6,631			1,900
CURRENT LIABILITIES AND PROVISIONS :—			*(Market Value on 31st December, 1952, £1,836).*		
Publications, subscriptions in advance	10,712		PROPORTION OF ALTERATIONS, ETC., OF PREMISES :—		
Printing and Publishing Expenses	2,093		Payable by the Trust Fund as at 31st December, 1951 ...	300	
Bowen Prize Fund	50		*Less :* Amount written off this year	300	
Due to The Institute of Physics	1,996				—
		14,851	STOCK ON HAND, PUBLICATIONS AND DISPATCH	7,056	
			Less : Books, Stock depreciation Reserve	653	
					6,403
C. SYKES,			SUNDRY DEBTORS, Publications, etc.		7,679
President.			CASH AT BANK		5,500
S. WHITEHEAD,					
Honorary Treasurer.					
		£21,482			£21,482

We have audited the above Balance Sheet and have obtained all the information and explanations we have required. We have verified the Bank balances and the investments. In our opinion such Balance Sheet is properly drawn up so as to exhibit a true and correct view of the state of the Fund according to the best of our information and the explanations given to us and as shown by the books of the Fund.

Spencer House, South Place, London, E.C.2.
18th February, 1953.

KNOX, CROPPER & CO., *Chartered Accountants.*

THE INSTITUTE OF PHYSICS BENEVOLENT FUND

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST DECEMBER, 1952

1951		£	1951		£
£			£		
352	To Grants	276	461	By Subscriptions and Donations	1,508
—	„ Printing and Stationery	15	42	„ Interest	68
307	„ Balance carried to Capital Account	1,447	156	„ Royalties on Books	162
£659		£1,738	£659		£1,738

BALANCE SHEET 31ST DECEMBER, 1952

	£	£		£	£
CAPITAL ACCOUNT :—			INVESTMENTS at cost :—		
On 31st December, 1951	2,315		£350 3½% War Stock	351	
Add: Transfer from Income and Expenditure Account...	1,447		£750 4% Consols	832	
		3,762	£500 3% Savings Bonds, 1955-65	496	
					1,679
S. WHITEHEAD,			(*Market Value on 31st December, 1952, £1,382*)		
Chairman of the Fund Committee.					
			CASH ON DEPOSIT at Post Office Savings Bank		570
H. R. LANG,			THE INSTITUTE OF PHYSICS		918
Secretary of the Fund Committee.			CASH AT BANK		595
		£3,762			£3,762

We have audited the above Balance Sheet and have obtained all the information and explanations we have required. We have verified the Bank balances and the investments. In our opinion such Balance Sheet is properly drawn up so as to exhibit a true and correct view of the state of the Fund according to the best of our information and the explanations given to us and as shown by the books of the Fund.

Spencer House, South Place, London, E.C.2.
18th February, 1953.

KNOX, CROPPER & Co., *Chartered Accountants.*

APPOINTMENTS VACANT

The inclusion of particulars of a vacancy must not be taken to imply that the Institute necessarily approves of the terms offered or that might be offered. Candidates should satisfy themselves that these are satisfactory, and they may always refer to the Institute for advice.

The Royal Technical College, Glasgow (affiliated to the University of Glasgow), Department of Natural Philosophy. Applications are invited for the post of **Senior Lecturer** in Physics. The salary will be on the scale £1,150 × £50 to £1,450. High academic qualifications and research experience are essential ; experience in industry would be counted an advantage. Application forms and further particulars may be obtained from the Secretary of the College.

Cathode ray tube manufacturers require Physicists in the grades of **Senior Scientist** and **Scientist** for work on the development of oscillograph and television tubes. Some experience essential. Salary range commensurate with qualifications and experience. Write in confidence, giving full particulars of education and posts held to the Personnel Manager, **Electronic Tubes Limited,** Kingsmead Works, High Wycombe, Bucks.

South West Metropolitan Hospital Region. Mental Hospitals Group Laboratories, West Park, Epsom, require a **physicist** with good honours degree and experience in the study of viscosity and problems of flow in liquids required for a temporary research post providing an opportunity for exploratory work with a new technique. Salary (range £410 — £735 plus London weighting) according to experience, and conditions as defined in P.T.A. Circular No. 9 of the Whitley Councils for the Health Services. Apply with two up-to-date references to the Group Pathologist at the above address.

University of Hong Kong invite applications for the vacant Chair of Physics.

The post is superannuable, and the total emoluments for a married man not normally resident in Hong Kong or China are : £2,280 - £50 — £2,530 per annum.

Applicants should be graduates of British Universities, and should have appropriate qualifications and experience.

First class sea passages on original appointment and on long leaves, and furnished houses or flats at reasonable rentals are provided for expatriate staff and their families.

Further particulars and information as to the method of application should be obtained from the Secretary, Association of Universities of the British Commonwealth, 5 Gordon Square, London, W.C.1.

The closing date for the receipt of applications, in London and Hong Kong, is April 30, 1953.

Chief Analytical Chemist required for Ice Cream and Meat products factories of large nationally known food manufacturers in West London area. Essential qualifications are F.R.I.C. (E) with experience in similar trade and/or public analysts laboratory work. Salary according to age and experience, superannuation scheme. Apply quoting brief personal details, for application form to Box 35, The Institute of Physics, 47 Belgrave Square, London, S.W.1.

Physical Chemist for research and development work in food manufacture, together with quality control of existing processes. Applicants must be under 30 years of age, and must possess a B.Sc., or equivalent qualification. Previous experience in the Food Industry is desirable. Salary according to age and experience. Apply quoting brief personal details, for application form, to Box 36, The Institute of Physics, 47 Belgrave Square, S.W.1.

Male **technical assistant** required for work on ballistics research on small arms ammunition. Minimum qualification University degree. Knowledge of and some experience in electronics essential. Age 23–28. Salary up to £1,100 per annum dependent on age, qualifications, and experience. Write to Staff Officer, Box A.V.34, The Institute of Physics, 47 Belgrave Square, London, S.W.1.

The **University of Liverpool** invite applications for the post of **Lecturer in Theoretical Physics** at an initial salary within the range £550–£1,100 per annum, according to qualifications and experience. Applicants should have experience in solid state physics.

Applications stating age, academic qualifications and experience together with the names of two referees should be received not later than May 15, 1953, by the undersigned, from whom further particulars of the conditions of appointment may be obtained. S. Dumbell, Registrar.

National Coal Board invite applications for superannuable appointments as **Scientist Grade II** (salary scale £645 x £30 to £1,095, plus London Location Allowance) at the Central Research Establishment, 11 Worton Road, Isleworth, Middx.

Candidates should have good honours degree (or equivalent) and at least three years' post-graduate research experience in one or more of the following fields :—Tele-communications, automatic control, electro-magnetic theory.

Write, giving full particulars (in chronological order) of age, education, qualifications and experience (with dates) to National Coal Board, Establishments (Personnel), Hobart House, Grosvenor Place, London, S.W.1, marking envelope TT/608. Original testimonials should *not* be forwarded. Closing date April 25, 1953.

Physicist required to set up a Physics Laboratory for a research organisation concerned with surgical dressings, pharmaceuticals and a wide range of allied products. He will be required to work as a member of a team of about 20 graduates in allied sciences, but he will be the only physicist in the team. Apply SCM/IP, **Smith & Nephew Research Limited,** Hunsdon Laboratories, Ware, Herts.

University College, London. Graduate electronic engineer required for work in Department of Anatomy (Prof. J. Z. Young), on the problem of counting and measuring microscopic particles, for research in television microscopy and its application to central nervous system. Possibility of working for higher degree. Salary £1,000 p.a. Applications, to be received by May 1, 1953, should be sent to the Secretary, University College London, Gower Street, W.C.1, from whom further particulars may be obtained.

Northampton Polytechnic, St. John Street, London, E.C.1, invite applications for a full-time **Assistant Lecturer** in the Department of Applied Physics. Candidates should possess an Honours Degree in Physics and preference will be given to those with a special interest in Illumination or Optics. Salary in accordance with the London Technical Burnham scale Grade B viz : £490 by £25 to £765 with allowance of £60 for graduates or equivalent and up to £54 for training plus London Allowance of £36 (£48 if over 37). Particulars and form of application from the Secretary of the Polytechnic.

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